citEcar Bubble Buddy

Owner's Manual

Sold and Distributed by

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Preface

Thanks for purchasing our electric vehicle. This manual contains information for proper operating, maintaining and caring of your electric vehicle. A thorough understanding of this manual will help you to obtain maximum enjoyment from this electric vehicle. Please keep it properly stored for future reference.

Important Information:

Particularly important information is distinguished by the following notations:

WARNING!
Fail to follow Warning instructions could result in severe injury to the vehicle occupants, bystanders or persons inspecting or repairing the vehicle.

CAUTION!
Failure to follow Caution instructions could cause damage to the vehicle.

Special Notices:

Because the seat & backrest wrapping film may stick to the seat vinyl and cause the seat vinyl to become stained, please remove the seat & backrest wrapping film when you receive the vehicle.

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1. Overview

Our vehicle is environment-friendly, and it can be used as people mover or utility car on a golf course, vacation villages, villa areas, resort hotels, private residential areas, tourist scenic spots, or any other places where this type of vehicle is allowed.

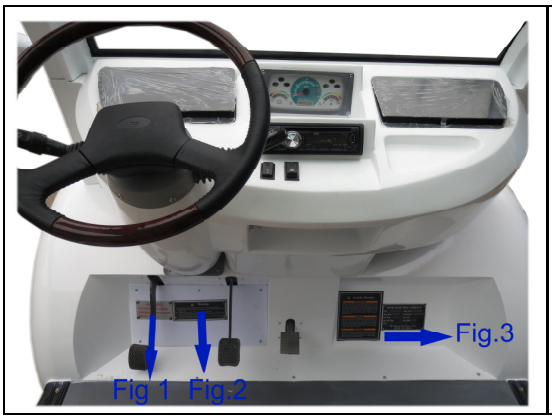
WARNING!

Please always be sure of whether there is any restriction in the area where you intend to use the vehicle to avoid any unpleasant experience.

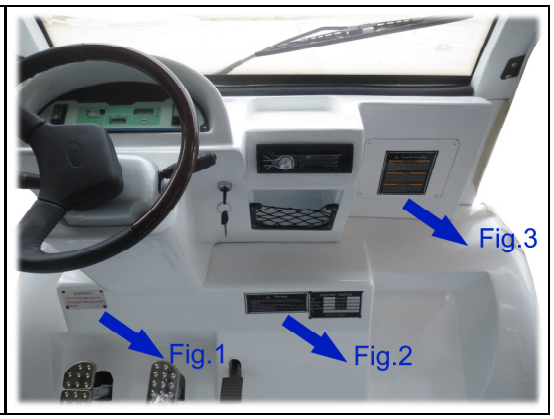
IMPORTANT LABELS

SAFETY LABEL

Read carefully and understand the contents on the safety label attached on the vehicle. (Photos below shows the position of the safety labels on our two vehicle styles)



Safety labels on LE style vehicle



Safety label on SE style vehicle

Label content of the safety labels

Fig. 1

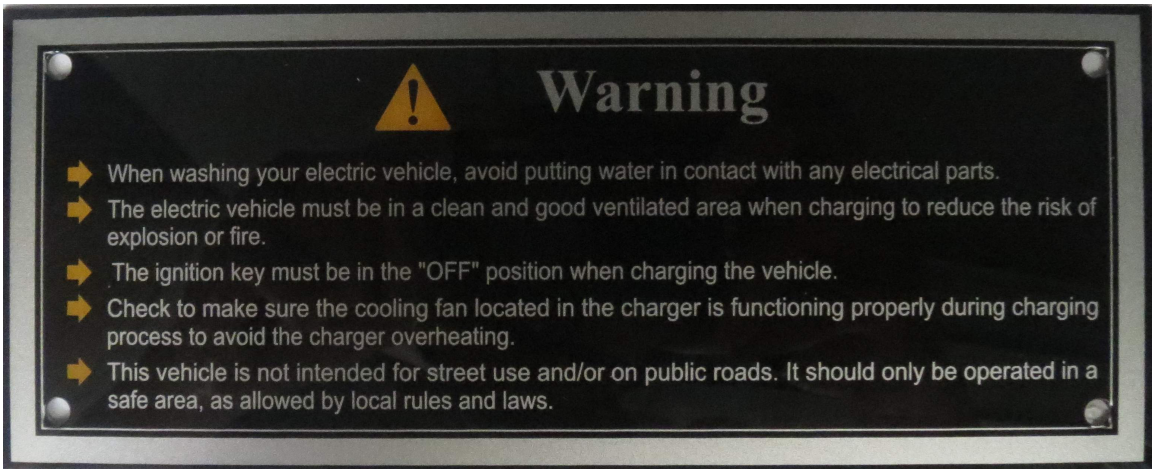

Warning
When washing your electric vehicle, avoid putting water in contact with any electrical parts.
The electric vehicle must be in a clean and good ventilated area when charging to reduce the risk of explosion or fire.
The ignition key must be in the "OFF" position when charging the vehicle.
Check to make sure the cooling fan located in the charger is functioning properly during charging process to avoid the charger overheating.
This vehicle is not intended for street use and/or on public roads. It should only be operated in a safe area, as allowed by local rules and laws.

Fig.2

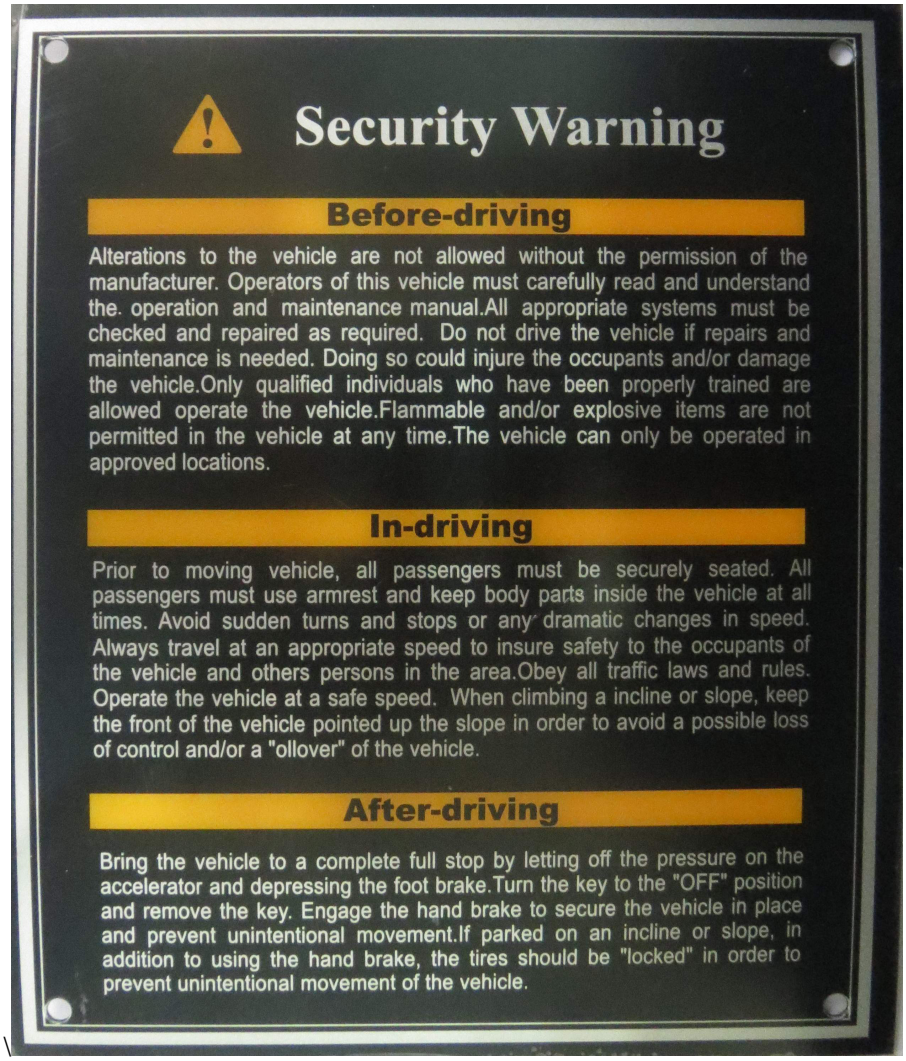
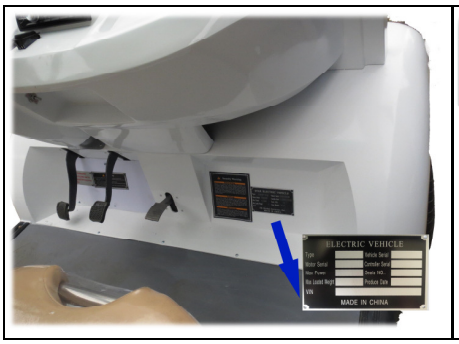

Security Warning
Before-driving
Alterations to the vehicle are not allowed without the permission of the manufacturer. Operators of this vehicle must carefully read and understand the. operation and maintenance manual.All appropriate systems must be checked and repaired as required. Do not drive the vehicle if repairs and maintenance is needed. Doing so could injure the occupants and/or damage the vehicle.Only qualified individuals who have been properly trained are allowed operate the vehicle.Flammable and/or explosive items are not permitted in the vehicle at any time.The vehicle can only be operated in approved locations.
In-driving
Prior to moving vehicle, all passengers must be securely seated. All passengers must use armrest and keep body parts inside the vehicle at all times. Avoid sudden turns and stops or any dramatic changes in speed. Always travel at an appropriate speed to insure safety to the occupants of the vehicle and others persons in the area.Obey all traffic laws and rules. Operate the vehicle at a safe speed. When climbing a incline or slope, keep the front of the vehicle pointed up the slope in order to avoid a possible loss of control and/or a "ollover" of the vehicle.
After-driving
Bring the vehicle to a complete full stop by letting off the pressure on the accelerator and depressing the foot brake.Turn the key to the "OFF" position and remove the key. Engage the hand brake to secure the vehicle in place and prevent unintentional movement.If parked on an incline or slope, in addition to using the hand brake, the tires should be "locked" in order to prevent unintentional movement of the vehicle.

Fig.3

Vehicle Information (Name Plate)

The name plate is at the low part of the dashboard as below: Fig. 1 shows the position of the name plate for LE style vehicle; Fig .2 shows the position of the name plate for SE style vehicle.



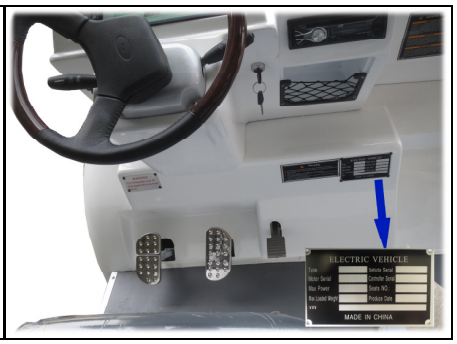
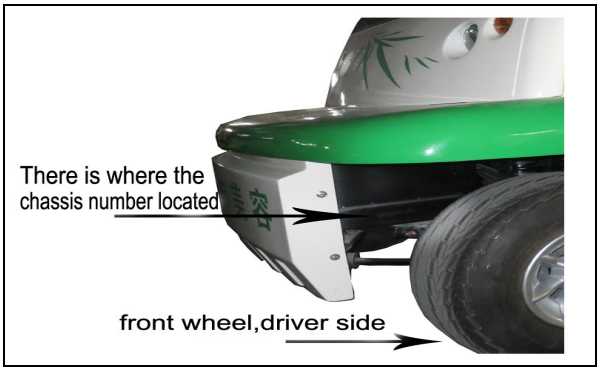


Fig.1 **Fig.2**

Chassis number of the vehicle:

The position where the chassis number is located is shown in the picture below.



2. Controls

1) **Schematic Figure of controls** (There are two types of dashboards on the vehicles, we name them LE & SE Style Dashboard whose designs are significantly different. Please first look to see which style of dashboard your vehicle has, then follow the instruction below.

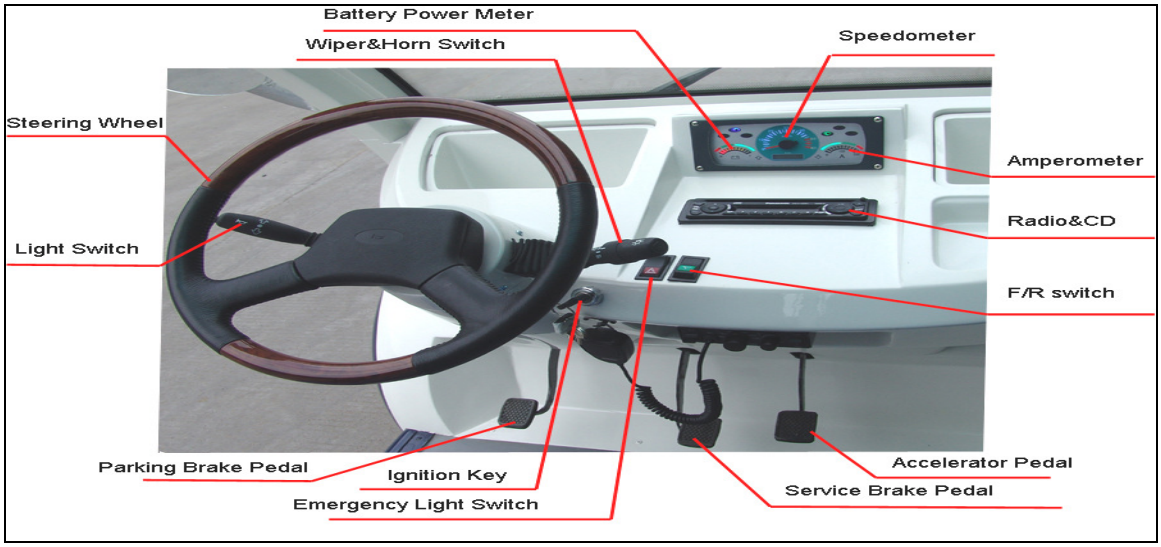


Fig.1 (for LE style vehicle)

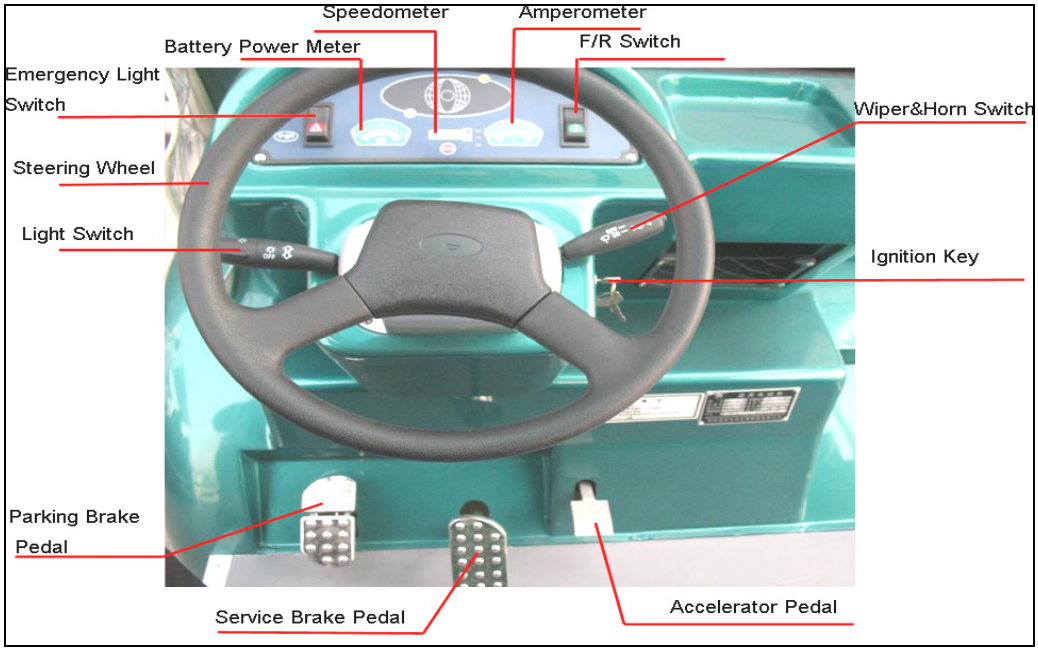
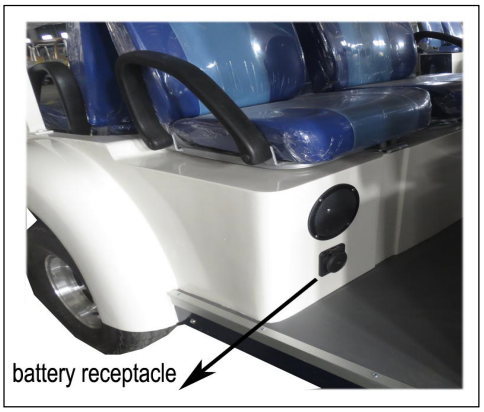
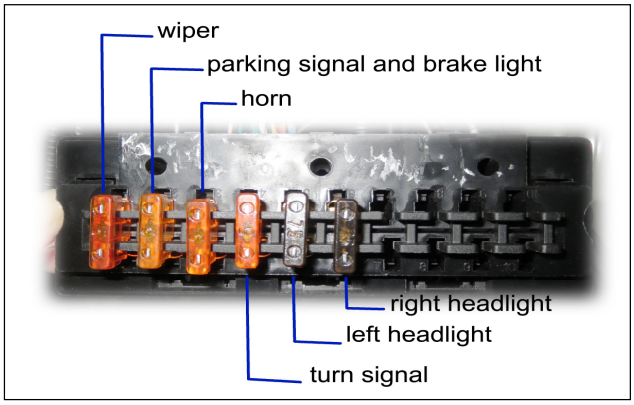


Fig. 2 (for SE style vehicle)





2) Functions of Controls

Ignition key

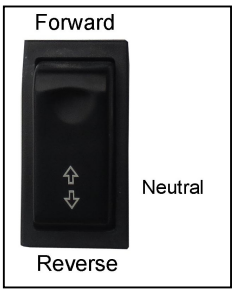
The ignition key is used to switch on the electrical system of the vehicle.

To engage the motor and start the vehicle, insert the key and turn it clockwise to the ON position, at the same time, the 12V accessory system (including the headlight, turn signal, tail light, brake light and horns) will be engaged too.

To switch the power off, turn the key counterclockwise to OFF position.

CAUTION! When the Key is on 'ON' position, the key cannot be pulled out. Don't try to pull out the key when it's on 'ON' position!

Forward/Reverse switch



This is a three-position switch, pressing the upper part gets the vehicle moving forwards while pressing the lower part gets the vehicle moving backwards, and the middle is neutral.

WARNING! This switch must be fully pressed into the proper position, or the electric system and motor will be damaged.

NOTE: The buzzer will beep when the lower part of this switch is pressed, to warn people around your vehicle.

Accelerator pedal

The accelerator pedal is used to control the speed when driving. Push down on it slowly to increase the speed. The vehicle will speed up with the gradual pushing down of the pedal, eventually reaching the full speed when the pedal is push down to the bottom. The vehicle slows down with the lifting of the pedal. When the pedal is fully lifted, the electric brake will start to work, and the vehicle will stop.

Service Brake pedal

The parking brake pedal is used in braking. (Fig 1 is for SE style vehicle and Fig. 2 is for LE style vehicle)

Fig.1 Fig.2

Parking Brake Pedal

The parking brake pedal is used in braking for parking. The parking brake should be engaged into parking position whenever the vehicle is left unattended. (Fig.1 is for LE style vehicle and Fig.2 is for SE style vehicle)

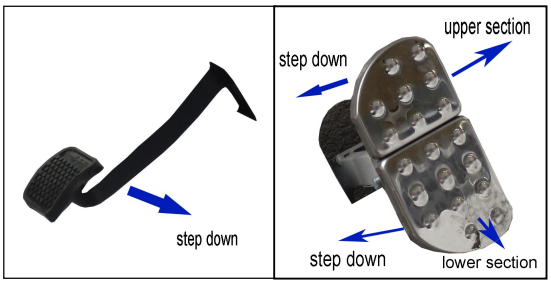


Fig.1 Fig.2

How to engage and disengage the parking brake?

To engage the parking brake

For LE style vehicle, step down the parking brake pedal by foot until it's hooked

For SE style vehicle, step down upper section of the parking pedal by foot until it's hooked.

To disengage the parking brake,

For LE style vehicle, step down the parking brake pedal to the end until the parking brake pedal is unhooked.

For SE style vehicle, step down lower section of the parking to the end until parking brake pedal is unhooked.

WARNING!

Please always disengage the parking brake pedal before you drive the vehicle otherwise it will damage the brake system and motor badly.

WARNING!

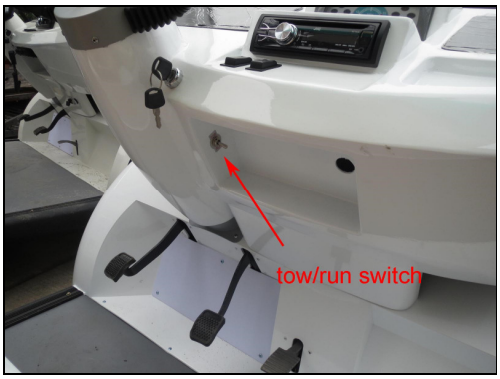
It is prohibited to step down both service brake & parking brake pedal and accelerator pedal all together; otherwise will damage the motor badly.

Steering Wheel

The steering wheel is used to control the driving direction. Please avoid any sudden and wild turning.

TOW/RUN SWITCH (available for Curtis 1268 controller)

Before operating the vehicle, make sure the TOW/RUN switch is on the 'RUN' position.
Make sure the TOW/RUN switch is on the 'TOW' position if towing or pushing the vehicle.
The TOW/RUN switch is located under the dashboard as shown in the pictures below.



NOTE: When the TOW/RUN switch is on the 'RUN' position, the vehicle will beep when pushed, to remind you to stop.

WARNING!

Whenever the TOW/RUN switch is moved from the RUN position to the TOW position, please move it back to the RUN position, there is a delay of approximately 30 seconds before the vehicle will run.

COMBINATION SWITCH:

The combination switch includes a left lever and a right lever: The left lever of the switch is used to switch on/off the lighting system including headlight, front turn signal, rear turn signal, taillight; the right lever is to control the wiper and horn. (Fig 1 for LE style vehicle, Fig 2 for SE style vehicle)

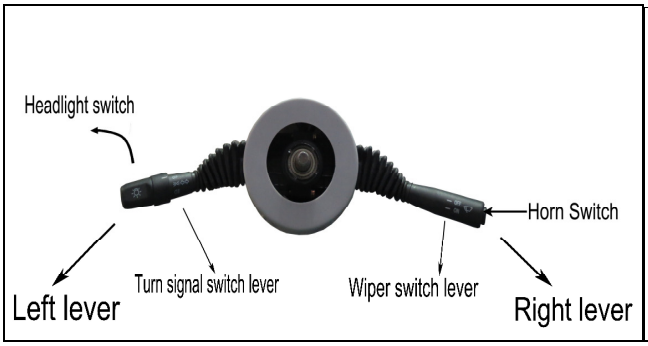


Fig.1

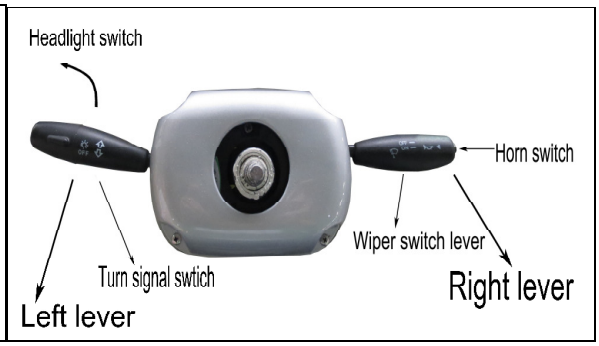


Fig.2

Left lever:

It's used to control the lights including headlight, taillight and turning light.

1) Turn the top button to power on the headlight; and turn back to power off the headlight and taillight.
2) Push the lever up to engage the right turning light when planning to turn and drive the vehicle to the right.
3) Pull the lever down to engage the left turning light when planning to turn and drive the vehicle to the left.

Right lever

It's used to control the wiper and horn

Wiper switch: This switch is used to control the windshield wiper.

NOTE: The operation of the wiper switch for 03 style vehicle and 02 style vehicle is different.

(Fig 1 for LE style vehicle, Fig 2 for SE style vehicle)

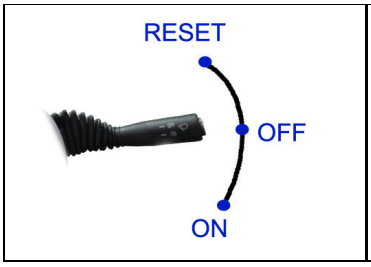


Fig.1

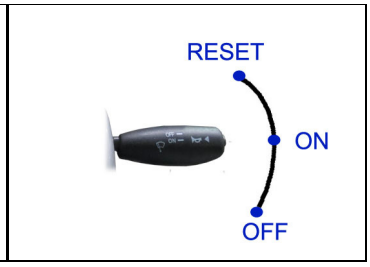


Fig.2

For the operation of the wiper switch for LE style vehicle please refer to Fig.1

1.) push the wiper lever to the bottom to switch on the wiper
2.) push the wiper lever to the middle position to switch off the wiper
3.) push the wiper level to the top position to reset the wiper

For the operation of the wiper switch for SE style vehicle please refer to Fig.2

4.) push the wiper level to the bottom to switch off the wiper
5.) push the wiper lever to the middle position to switch on the wiper
6.) push the wiper level to the top position to reset the wiper

Horn Switch: Press the button on the lever to activate the horn.

Emergency Light Switch— The emergency light switch is located near the digital dashboard, press the lower part of the button, the front and rear left and right turn lights will turn on and flash to warn people around the vehicles. Press the upper part of the button to shut down.

DIGITAL DASHBOARD:

(Fig 1 for LE style vehicle, Fig 2 for SE style DC vehicle)

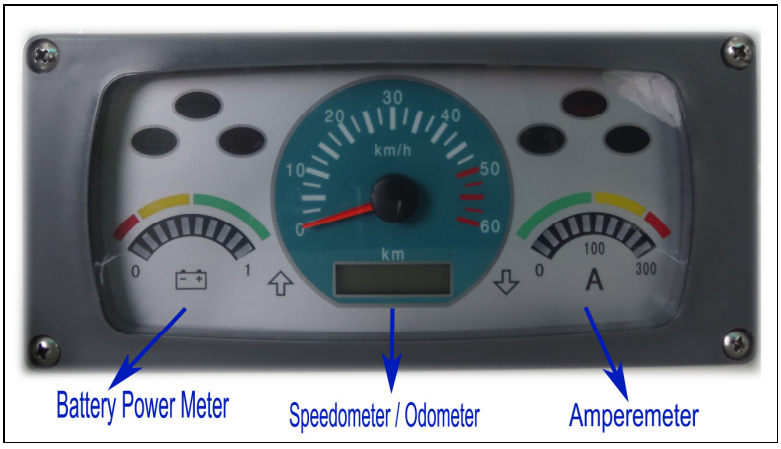


Fig.1

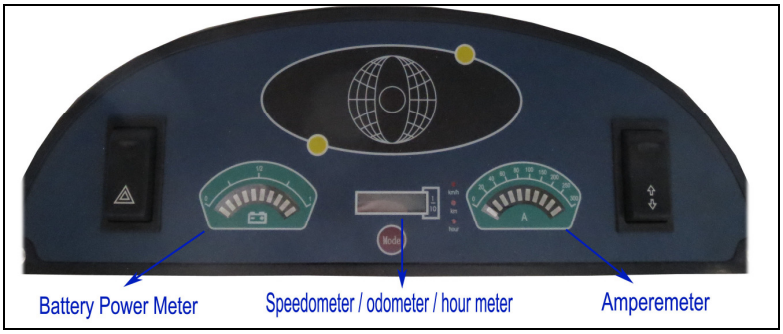


Fig. 2

Speedometer / Odometer —— Indicates the running speed of the vehicle and accumulated distance the vehicle has run. For SE style vehicle, press the button "MODE", the meter will show speed, accumulated distance and hours the vehicle has run. For 03 style vehicle, the speed and the accumulated distance will show on the digital dashboard directly.

Amp Meter —— Indicates the current of the vehicle.

Battery Power Meter

There are 10 divisions on the meter (from 0 to 1). The meter will decline from the top to the bottom as the battery discharges. When the battery is too low, the red indicator light will flash, reminding you to recharge the battery.

NOTE: Please refer to your Battery Charging section of the Owner's Manual regarding how to recharge the batteries.

3. Safe Operation Instructions

Our electric vehicle is designed for simple operation; however, please make sure to observe the following safe operation instructions:

BEFORE OPERATING THE VEHICLE:

- ALWAYS read this first before you start driving the vehicle.
- ONLY authorized people should drive this vehicle, from the driver's side ONLY.
- Do not drive this vehicle on a public road before it's registered and has the license plate attached.
- Drive the vehicle ONLY in areas where it is allowed to be used by law or local regulations and the conditions are safe to do so.
- DO NOT allow more than the designated people on the vehicle.
- DO NOT overload the vehicle in any case, otherwise the motor may be damaged, the vehicle may also lose control and putting the driver and passenger(s) in danger.
- DO NOT operate the vehicle while under the influence of alcohol or drugs, otherwise, their effect on vision and judgment will put the driver and passenger(s) in danger.
- DO NOT make the vehicle climb any slope beyond its grade allowance.
- DO NOT overtake other vehicles at crossroads, in blind areas or in any dangerous areas.
- Always fasten the safety belt properly before the vehicle moves, adhering to the following instructions.
  1) Be certain the seat belts are latched securely and are free from twists.
  2) Position the shoulder belt across the top of the shoulder. Do not place the shoulder belt under an arm.

3) Loose fitting safety belts significantly reduce protection. Keep belts snug and positioned low on the hips.

4) Do not exceed the recommended number of occupants for the vehicle.

5) Bench seats are designed for two occupants only.

WHILE OPERATING THE VEHICLE

- Keep your entire body inside the vehicle, keep seated and hold on while the vehicle is moving.
- Do not start the vehicle until all occupants are securely seated.
- Keep your hands on the steering wheel and your eyes on the path you are going.
- Always back up slowly, and watch the back carefully.
- Avoid starting or stopping suddenly.
- Avoid turning the steering wheel too sharply at high speed.
- Always drive slowly up or down on the incline.
- Do not make any modification or addition which may affect the capacity or safety of the vehicle.

Children are not allowed to play in the vehicle. Children should be seated between adults and protected by them when the vehicle is moving.

4. Operation

STARTING:

- Disengage the parking brake pedal.

CAUTION!

Failure to disengage the parking brake when driving the vehicle will cause the motor to burn!

- With the Forward/Reverse switch on the Neutral position, turn the power key to ON position.

CAUTION!

The car will not run if you press down the F/R switch to the Forward or Reverse position before turning on the power key when equipped with AC system.

- Press the Forward/Reverse switch and lock it in the desired position.

WARNING!

Do not shift from Forward↑to Reverse↓or from Reverse↓to Forward↑when the car is moving.

- Step down on the acceleration pedal slowly, the vehicle will start to move.

WARNING!

Do not step down the accelerator pedal when turning on the power key, otherwise, the vehicle may suddenly start moving.

CAUTION!

If the accelerator pedal is stepped down before the power key is on, the vehicle will not run. In this case, you should release the accelerator pedal first, and then turn the power key ON, then step down the accelerator pedal again, the vehicle will start moving.

STOPPING:

To stop the vehicle, gradually press down the brake pedal. When the vehicle has come to a stop, apply the parking brake pedal and turn the power key to OFF and press the F/R switch on Neutral position.

CAUTION: Do not hold the vehicle on an incline with the accelerator, please use the brake.

5. MAINTENANCE

Users should perform regular maintenance to ensure the vehicle is operating at optimum performance.

5.1 Maintenance of the Battery

NOTE: Our standard vehicles are equipped with deep-cycle flooded lead-acid batteries. If your vehicle is equipped with any other type of batteries, please follow the maintenance instruction by the battery manufacturer. The maintenance instruction below is especially for deep-cycle flooded lead-acid battery.

WARNING! Battery electrolyte is poisonous and dangerous, and may cause severe burns, injury, etc… Always wear protective clothing, gloves and goggles when handling batteries, electrolyte, and charging your battery.

KEEP OUT THE REACH OF CHILDREN.

1. Cleaning

The exterior of the battery, the connection wires and bolts should always be kept clean and dry. When cleaning, please make sure all vent caps are tightly in place. Clean the battery top with a cloth or brush and solution of baking soda and water. When cleaning, do not allow any cleaning solution, or other foreign matter to get inside of the battery. This should be done every week.

Clean the battery terminals and the inside of cable clamps using a post and clamp cleaner. Clean terminals will have a bright metallic shine. This should be done when it is necessary.

Reconnect the clamps to the terminals and thinly coat them with petroleum jelly (Vaseline) to prevent corrosion.

WARNING! Before you disconnect any battery cable from any terminal on the battery, please always turn off the power by disconnecting the main battery cable from the controller.

2) Checking the terminals and nuts

The connection of the battery should always be kept in good condition. Please check every week as to whether any battery cable terminal or nut has become loose in order to prevent any spark or damage to terminals. Please check every week whether any battery cable is damaged or not, any damaged battery cable should be replaced immediately.

3) No foreign matter

Do not place any objects on the battery and do not connect the positive pole to the negative pole. This may cause a short circuit, dangerous spark, or may cause damage to the battery or injury to the user.

4) Recharging

a. As long as you use the vehicle, regardless of how long you have used it, the battery should be recharged fully on the same day. Any delay in the recharging will cause a negative effect on the battery. Note: the lead-acid battery does not develop a memory, so it does not need to be fully discharged before recharging.

b. If the vehicle is going to be kept unused for a long time, the battery should be fully recharged first. After that, the battery should be fully recharged every 2 weeks.

c. When driving, the driver should always be aware of the drop level of the battery power from the battery power meter, any drop means the battery power is diminishing. Besides, the driver should estimate the distance needed to be taken, and recharge the battery at a proper time in case that the vehicle cannot get back to the recharging station in time for recharging.

WARNING! Please make sure the battery is recharged before the battery power meter shows 20% power is left. An over-discharged battery will have a very short service life and will make recharging very difficult.

WARNING! During recharging, the vehicle should be parked in a well-ventilated area with filling caps tightly secured. Keep far away from any flame and sparks to avoid any explosion or fire that could cause physical injury or damage to the property and the user.

5) Watering

Flooded batteries need water. The watering must be done at the right time and in the right amount or else the battery's performance and longevity suffers. Water should always be added after fully charging. Prior to charging, there should be enough water to cover the plates. If the battery has been discharged (partially or fully), the water level should also be above the plates. Keeping the water at the correct level after a full charge, then you will not have to worry about the water level at a different state of charge.

Depending on the local climate, charging methods, and application, etc., Trojan recommends that batteries be checked once a month until you get a feeling for how thirsty your batteries are.

Important things to remember:

1. Do not let the plates get exposed in the air. This will damage (corrode) the plates.

2. Do not fill the water to the cap. This most likely will cause the battery to overflow acid, consequently losing capacity and causing a corrosive mess.

3. Do not use water with a high mineral content. Use distilled or deionized water only.

CAUTION:

The electrolyte is a solution of acid and water so skin contact should be avoided.

Step by step watering procedure:

1. Open the vent caps and look inside the filling wells.
2. Check electrolyte level; the minimum level is at the top of the plates.
3. If necessary add just enough water to cover the plates once.
4. Put batteries on a complete charge before adding water (refer to the Charging section).
5. Once charging is completed, open the vent caps and look inside the fill wells.
6. Add water until the electrolyte level is 1/8" below the bottom of the fill well.
7. A piece of rubber can be used safely as a dipstick to help determine this level.
8. Clean, replace, and tighten all vent caps.

WARNING!

Never add acid into the battery.

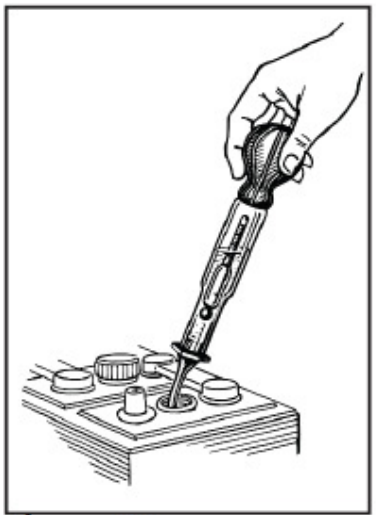
6) Testing

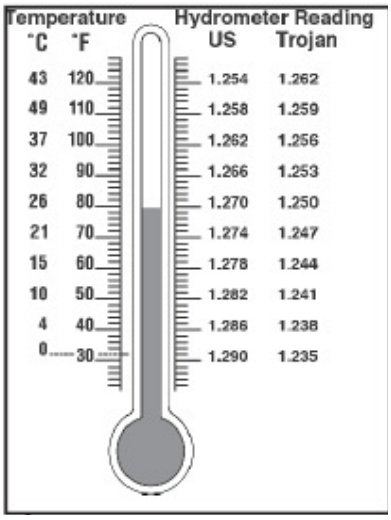
Visual inspection alone is not sufficient to determine the overall health of the battery. Both open-circuit voltage and specific gravity readings can give a good indication of the battery's charge level, life span, and health. Routine voltage and gravity checks will not only show the state of charge but also help spot signs of improper care, such as undercharging and over-watering, and possibly even locate a bad or weak battery. The following steps outline how to properly perform routine voltage and specific gravity testing on batteries.

I. Specific Gravity Test (Flooded batteries only)

1. Do not add water.
2. Fill and drain the hydrometer 2 to 4 times before pulling out a sample.
3. There should be enough sample electrolyte in the hydrometer to completely support the float.
4. Take a reading, record, and return the electrolyte back to the cell.
5. To check another cell, repeat the 3 steps above.

6. Check all cells in the battery.
7. Replace the vent caps and wipe off any electrolyte that might have been spilled.
8. Correct the readings to 80° F: Add .004 to readings for every 10° above 80o F, Subtract .004 for every 10° below 80° F.
9. Compare the readings.
10. Check the state of charge using Table 1. (see next page)





The readings should be at or above the factory specification of 1.277 +/- .007. If any specific gravity readings register low, then follow the steps below.
1. Check and record voltage level(s).
2. Put battery(s) on a complete charge.
3. Take specific gravity readings again.

If any specific gravity readings still register low then follow the steps below.
1. Check voltage level(s).
2. Perform equalization charge. Refer to the Equalizing section for the proper procedure.
3. Take specific gravity readings again.

If any specific gravity reading still registers lower than the factory specification of 1.277+/- .007 then one or more of the following conditions may exist:
1. The battery is old and approaching the end of its life.
2. The battery was left in a state of discharge too long.
3. Electrolyte was lost due to spillage or overflow.
4. A weak or bad cell is developing.
5. Battery was watered excessively previous to testing.

Batteries in conditions 1 - 4 should be taken to a specialist for further evaluation or retired from service.

II. Open-Circuit Voltage Test

For accurate voltage readings, batteries must remain idle (no charging, no discharging) for at least 6 hrs, preferably 24 hrs.
1. Disconnect all loads from the batteries.
2. Measure the voltage by a DC voltmeter.
3. Check the state of charge with Table 1.
4. Charge the battery if it registers 0% to 70% charged.

If the battery value is lower than that in Table 1, the following conditions may exist:
1. The Battery was left in a state of discharge too long.
2. The Battery has a bad cell.
Batteries in these conditions should be taken to a specialist for further evaluation or retired from service.

TABLE 1. State of charge as related to specific gravity and open circuit voltage

Percentage of Charge	Specific Gravity Corrected to 80° F	Open-Circuit Voltage					
		6V	8V	12V	24V	36V	48V
100	1.277	6.37	8.49	12.73	25.46	38.20	50.93
90	1.258	6.31	8.41	12.62	25.24	37.85	50.47
80	1.238	6.25	8.33	12.50	25.00	37.49	49.99
70	1.217	6.19	8.25	12.37	24.74	37.12	49.49
60	1.195	6.12	8.16	12.24	24.48	36.72	48.96
50	1.172	6.05	8.07	12.10	24.20	36.31	48.41
40	1.148	5.98	7.97	11.96	23.92	35.87	47.83
30	1.124	5.91	7.88	11.81	23.63	35.44	47.26
20	1.098	5.83	7.77	11.66	23.32	34.97	46.63
10	1.073	5.75	7.67	11.51	23.02	34.52	46.03

7) Battery Installation

WARNING!

When working with the battery, DO NOT put wrenches or any other metal objects across the battery terminals, otherwise, an arc can occur, and it may cause explosion of the battery and physical injury.

Battery is to be installed or replaced only by a qualified electrician.

8) Battery Charging

NOTE: We provide two types of chargers for our vehicle, one is non-onboard charger, and another is onboard charger. The standard charger is non-onboard charger. Check your vehicle to determine which kind of charger it is? The onboard charger is either installed in the rear bag well, or under the seat, or under the front body. When it's onboard charger, a separate charging cord will be provided with the vehicle for connecting the charger and AC electricity.

WARNING! Before you use the charger, please read the operation manual provided with the charger.

WARNING! Explosive hydrogen gas is produced while the battery is being charged. Only charge the battery in well-ventilated areas.

WARNING! Before using the charger, please check to make sure the battery charger you are going to use is correctly rated as per your local AC electricity network.

WARNING! When using a new battery, make sure the new battery is in same specifications as the original one and is appropriate in application.

The following are the charging steps:

1) Turn the ignition/power key to OFF.
2) Connect the DC output plug to the vehicle receptacle; and then connect it to your local AC power outlet.

WARNING!

Do not disconnect the DC output cord from the battery receptacle when the charger is ON. Otherwise an arc could occur which may cause an explosion.

3) The charger will turn off automatically when the battery is charged fully.

WARNING!

For non-onboard charger, the battery receptacle is combined with a security switch which can cut off the power of the vehicle when the battery is being charged, so the vehicle cannot be started as long as the DC plug is plugged into the battery receptacle. For onboard charger, the vehicle can be driven when the charger is connected! Do not try to drive the vehicle when the charger is connected to avoid any possible damage to the charger or vehicle.

4) After the charger turns off, disconnect the plug on the AC charging cable from the AC power outlet first, and then disconnect the DC output plug from the vehicle receptacle.
5) It is prohibited to open the housing of the charger.
6) Only a qualified electrician is allowed to open the housing of the charger.
7) The charger should be stored in a safe and dry room with good ventilation.
8) The charger should be packed properly if not used for long time.
9) Read carefully the operation manual for the charger for detailed operation instructions.

Equalizing charge

Equalizing is an overcharge performed on flooded lead acid batteries after they have been fully charged. It reverses the buildup of negative chemical effects like stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Equalizing also helps to remove sulfate crystals that might have built up on the plates. If left unchecked, which is called Sulfation, it will reduce the overall capacity of the battery.

When the battery is fully charged, and it stays connected with the charger, every 8 hours the charger will charge 8 minutes to maintain the battery. After 20 hours, equalizing charge will start and last 2 hours. Equalizing charge can also be started manually by pressing down the ‘STOP’ button for 5 seconds when charging. Equalizing charge will start in 1 hour when the battery is fully charged.

Equalizing is recommended when low or wide ranging specific gravity (+/- .015) is detected after fully charging a battery.

5.2 The operation and maintenance of charger

Note: As standard configuration, the charger is built into the vehicle; in some cases, it may not be built into the vehicle. If it's built into the vehicle, the position of the charger is either under the seats or behind the front body.

The procedure to use the charger (when the charger is built in the vehicle).

1. Connect the cord to the receptacle on the vehicle;
2. Connect the cord to the receptacle to the outlet of household grid.
3. After the charger cord is connected, the red indicator on the charger will flash, charger starts the procedure of self-inspection, after self-inspection, green indicator flashes, and charger starts to charge the batteries.
4. When battery capacity is less than 80%, the green indicator flashes slowly. When battery capacity is more than 80%, the green indicator flashes fast. When the battery is fully charged, the green indicator will stop flashing and always be on and the charger will stop charging automatically.

Note: This charger has the function of over-discharging protection to protect the battery from over-discharging. When battery is close to the charging point, it will reduce the discharging current from the battery to reduce the speed of the vehicle, if it fails to charge the battery, it will cut the current from the battery and stop the vehicle to force user to charge the battery.

Note: When the grid voltage is out of range of 90-260V, the charger will stop charging to protect itself, at the same time, the failure code light will be on to remind users. When the voltage returns back to the requested voltage range of 90-260V, it will automatically start to charge.

Caution! Do not use charger if there is water in it.

Caution! Use the charger when the environment temperature is between -10℃ to +45℃

WARNING!

Only qualified electrician is allowed to open the housing of the charger.

WARNING!

When charging the batteries, hydrogen will be generated, so it's important to keep the charging area in safe and dry room with good ventilation; and also to avoid fire and spark.

5.3 Maintenance of the Traction DC Motor

WARNING! Check to make sure there is no explosive gas vapor in the air, otherwise, it may cause severe injury and damage to your body and property if the explosive gas vapor contacts the sparks generated from the motor.

1) For DC motor, the carbon brush should be checked every 3 months to see if it is worn or not as it is an easily worn part. If it is not replaced in time before it wears out, it will badly damage the motor.
2) Do not keep the motor running idle for long periods of time. Any idle running of the motor should be avoided.
3) Removal of mud, sand and other clinging objects should be done frequently to keep unit from overheating.
4) Periodically use low pressure air to remove the dust from the carbon brush and the commutator. Periodically check the connection of the carbon brush and the commutator.

Main malfunction symptoms and possible causes of DC motor

Item	Symptoms	Possible Causes
1	All copper plates turn black.	The pressure of the brush is incorrect.
2	The commutating copper turns black in a certain order and in groups.	Short circuit happens between the commutating copper or among the armature coil; poor welding or disconnection happens between the commutating copper and the armature coil.
3	The commutating copper turns black disorderly.	The central line of the commutator deviates or its surface is not round and not smooth.

4	The brush wears out, changes colors and breaks.	The motor vibrates; the clearance between the brush and its holder is too big; the clearance between the brush and commutators is too big; the mica between different commutators comes out; the brush is made of wrong materials; the brush is wrong type.
5	Big sparks	The motor is over-loaded; the commutators are not clean, not round or not smooth; mica or some commutator is coming out; the brush is not ground properly; the brush is under a lot of pressure; wrong brush type; the brush is jammed in the brush holder; the brush holder is loose or vibrating; the polarity and sequence of magnetic poles goes wrong.
6	The brush and its wires get hot.	Big sparks from the brush; poor contact between brush and soft wires; small section area of soft wires.
7	The brush is noisy	The surface of the commutator is not smooth.

Caution!
Only a Qualified Electrician Can Change and Adjust the Carbon Brush and Commutator.

Maintenance of the Traction AC Motor

If your vehicle is equipped with AC motor, then the motor is maintenance free!

5.4 Maintenance of the Speed Controller:

Caution!

Only a qualified electrician is allowed to do the maintenance for the controller.

WARNING!

There are no spare parts available inside the controller. No attempt should be made to open, repair, or otherwise modify the controller. Doing so may damage the controller and will void the warranty.

Cleaning

It is recommended that the controller be kept clean and dry and that its fault history file be checked and cleared periodically.

Periodically cleaning the controller exterior will help protect it against corrosion and possible electrical control problems created by the dirt, grime, and chemicals that are part of the operating environment and that normally exist in battery powered systems.

Please use the following cleaning procedure for routine maintenance:

1) Turn the power key to OFF position.
2) Remove power by disconnecting the battery.
3) Discharge the capacitors in the controller by connecting a load (such as a contactor coil or a horn) across the controller's B+ and B- terminals.
4) Remove any dirt or corrosion from the connector areas. The controller should be wiped clean with a moist rag. Dry it before reconnecting the battery. The controller should not be subjected to pressured water flow from either a standard hose or a power washer.
5) Make sure the connections are tight, but do not over tighten them.

Faulty History File

The handheld programmer (ordered separately) can be used to access the controller's fault history file. The programmer will read out all the faults the controller has experienced since the last time the history file was cleared. Faults such as contactor faults may be the result of loose wires; contactor wiring should be

carefully checked. Faults such as overheating may be caused by operator habits or by overloading.

After a problem has been diagnosed and corrected, it is a good idea to clear the fault history file. This allows the controller to accumulate a new file of faults. By checking the new history file at a later date, you can readily determine whether the problem was indeed fixed.

Or checking the problems according to the flashing of the STATUS light on the top of the controller, please refer to the details mentioned our service manual which is available separately.

Trouble-Shooting Guide (For Series System):

Symptoms	Possible Causes
The vehicle cannot be started.	A. The controller has no power: 1. There is something wrong with the battery or wire connections. 2. The fuse to power connection is burnt. 3. The resistance for pre-charging is broken. B. No signal is transmitted to the controller: 1. The ignition key is damaged or its wiring becomes disconnected. 2. The accelerator part of the pedal is damaged. 3. There is something wrong with acceleration pedal. 4. The polarity diode is broken or has a short. 5. The green wire connecting the acceleration pedal and the controller KSI is disconnected. C. The contacting point of the contactor becomes stuck. D. The controller of the motor is damaged.
The vehicle can only move forward and cannot be reversed, or vice versa	1. The switch is damaged. 2. The inserts on the commutators have become loose. 3. The commutators are damaged.
The vehicle can only run at slow speed	Insufficient Battery Handbrake is not engaged or brake shoe is not returning Accelerator Defect Controller Defect

Trouble Shooting Guide (For SEPEX System)

Please refer to Troubleshooting Chart of Curtis SEPEX controller.

Please contact your local dealer or a qualified electrician to work on the problems related to the motor, controller or electrical system of the vehicle when you are not able to fix them.

5.5 Diagnostics and Troubleshooting

The 1268 controller provides diagnostics information to assist technicians in troubleshooting the drive system problems. This information is displayed on the handheld programmer (or PC Programming Station), and it is also available in the form of fault codes issued by the controller's built-in Status LED and the optional remote LED driven by the controller's external LED output. Refer to the troubleshooting chart for suggestions covering a wide range of possible faults.

PROGRAMMER DIAGNOSTICS

The programmer presents complete diagnostic information in plain language. Faults are displayed in the Faults menu (see column 2 in the troubleshooting chart), and the status of the controller inputs/outputs is displayed in the Monitor Menu.

Accessing the Fault History menu provides a list of the faults that have occurred since the fault history file was last cleared. Checking (and clearing) the fault history file is recommended each time the vehicle is brought in for maintenance.

The following 4-step process is recommended for diagnosing and troubleshooting an inoperative vehicle: (1) visually inspect the vehicle for obvious problems; (2) diagnose the problem, using the programmer; (3) test the circuitry with the programmer; and (4) correct the problem. Repeat the last three steps as necessary until the vehicle is operational.

Example: A vehicle that does not operate in "forward" is brought in for repair.

Step 1: Examine the vehicle and its wiring for any obvious problems, such as broken wires or loose connections.

Step 2: Connect the programmer, select the Faults menu, and read the displayed fault information. In this example, the display shows "No Known Faults," indicating that the controller has not detected any problems.

Step 3: Select the Monitor menu, and observe the status of the inputs and outputs in the forward direction. In this example, the display shows that the forward switch did not close when "forward" was selected, which means the problem is either in the forward switch or the switch wiring.

Step 4: Check or replace the forward switch and wiring and repeat the test. If the programmer shows the forward switch closing and the vehicle now drives normally, the problem has been corrected.

TROUBLESHOOTING CHART

LED CODE	PROGRAMMER LCD DISPLAY	EXPLANATION	POSSIBLE CAUSE
1,1	HW FAILSAFE	Self-test or watchdog fault.	1. Controller defective.
1,2	THROTTLE FAULT 1	Wiper signal out of range	1. Throttle input wire open. 2. Throttle input wire shorted to B+ or B- 3. Throttle pot defective.
1,3	SPEED SENSOR FAULT	No pulses from sensor.	1. Speed sensor not connected. 2. Speed sensor defective.
1,4	HPD	High Pedal Disable fault.	1. Improper sequence of direction and throttle inputs.
1,5	MOTOR STALL	Motor stall at current.	1. Slope too steep for vehicle weight. 1. Mechanically locked motor. 2. EM brake wiring failure. 3. Speed sensor defective.

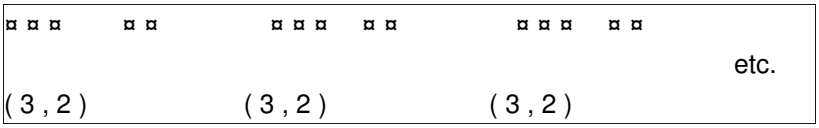
2,1	LOW BATTERY VOLTAGE	Low battery voltage.	1. Battery voltage is under voltage cutback threshold. 2. Corroded battery terminal. 3. Loose battery or controller terminal.
2,2	OVERVOLTAGE	Overvoltage.	1. Battery voltage is under voltage cutback threshold. 2. Vehicle operating with charger attached. 3. Battery was disconnected during regen braking.
2,3	THERMAL CUTBACK	Over-/under temperature.	1. Temperature > 85°C or < -25°C. 2. Excessive load on vehicle. 3. Improper mounting of controller. 4. Operating in extreme environments.
2,4	MAIN DRIVER ON	Main contactor coil held low.	1. Main contactor missing or wire to coil is open. 2. Controller defective.
2,5	AUX COIL FAULT	Missing aux (brake, relay) coil.	1. Aux coil open or not connected.
3,1	MAIN DRIVER OFF	Main contactor driver held high.	1. Main contactor coil shorted. 2. Controller defective.
3,2	MAIN WELDED	Main contactor welded.	1. Main contactor stuck closed. 2. Main contactor driver shorted
3,3	PRECHARGE FAULT	Internal voltage too low at startup.	1. External short, or leakage path to B- is on external B+ connection. 2. Controller defective.
3,4	FIELD MISSING	Field winding fault.	1. Motor field wiring loose. 2. Motor field wiring open.
3,5	AUX DRIVER OFF	Aux (brake, relay) driver held high.	1. Aux coil shorted. 2. Controller defective.

Troubleshooting Chart – *Cont'd*

4,1	CURRENT SENSE FAULT	Armature or field current sensor fault.	1. Controller defective.
4,2	DRIVER OVERCURRENT	Contactor driver or aux driver overcurrent.	1. Contactor or aux coil shorted.
4,3	M- SHORTED	Internal M- short to B-.	1. Controller defective.
4,4	AUX RELAY DNC	Aux relay did not close.	1. Aux relay missing or wire to coil open.
4,5	WELDED AUX RELAY	Welded aux relay.	1. Aux relay stuck closed. 2. Aux relay shorted.
5,1	KEY SWITCH SRO	SRO fault.	1. Key switch not off at power-up. 2. Key switch shorted.
5,2	MAIN COIL OPEN	Missing main contactor	1. Main contactor coil open or not connected.
5,3	AUX DRIVER ON	Aux (EM brake or WalkAway™ relay) driver coil held low.	1. Aux output short to ground. 2. Controller defective.

5,4	CIRCUIT BRKR OPEN	Circuit breaker or fuse open in WalkAway™ circuit.	1. Breaker/fuse tripped or open. 2. Breaker/fuse defective. 3. Relay/fuse sensor line broken.
5,5	MAIN DROPOUT	Main contactor open.	1. Main contactor defective.

A built-in Status LED is visible through a window in the label on top of the controller. When the controller detects a fault, the Status LED flashes the 2-digit fault code. The code is flashed continuously until the fault is corrected. For example, code “3,2”—welded main contactor—appears as:



The codes are listed in the Troubleshooting Chart. Only one fault is indicated at a time, and faults are not queued up. If multiple faults are active simultaneously, the code of the highest priority fault is flashed. After all faults have been cleared, the code of the last active fault will continue to flash for one minute. This feature is designed to help service personnel identify intermittent faults when no programmer is available. These same fault codes will also be flashed by the external fault LED (connected to Pin 22), if one is included in the system.

5.6 Maintenance of Rear Axle:

While using your vehicle, the rear axle should be maintained daily, periodically and randomly.

1. Periodic maintenance means the driver should do some daily maintenance before, during or after driving to prevent anything unexpected from happening. The maintenance is focused on cleaning and examination as followed:

1) Clean the dust and mud on the cover to keep the axle clean.
2) Make sure all the connections are in good condition, in case there may be any damage to any contact sticks or there is any travel in the contact.
3) Make sure the gear oil is full, if not add some.
4) Check to see if there is any link in the connection and transmission units or any unusual sound inside the axle;
5) Check the brake drum, the exterior temperature and smell, it should be adjusted and/or repaired immediately if there is any problem.
6) Check to make sure the breather valve is ventilated or not, in case the oil leaks.
7) Check if the there is any section in the parking brake cable broken or loosen, replace with a new one if needed.

2. Periodic maintenance: The axle should receive first grade maintenance, second grade maintenance and third grade maintenance

First grade maintenance focuses on lubrication, fixation and gear oil replacement.

Second grade maintenance focuses on checking adjustment and gear oil replacement.

Third grade maintenance focuses on the whole part cleaning, assembly and gear oil replacement.

Maintenance in each grade should follow the requirements as listed below.

Periodic maintenance schedule:

Period	Grade
Each Month	Do first grade maintenance as required above
Each 2 months	Do second grade maintenance as required above
Each half year	Do third grade maintenance as required above

Brake trouble and troubleshooting

Symptom(s)	Possible cause(s)	Troubleshooting
The axle housing gear and bearing are damaged and there is too much noise on the final drive	1. The gear oil is insufficient or used improperly	Add some oil or replace with new oil
	2. The bearing is assembled incorrectly	Assembly correctly
	3. Adjust the brake shoe pin shim or the interval.	Adjust or replace
	4. The gear between axle 1 and 2 is not touching tightly	Adjust correctly
	5. The final drive is too noisy: 1) Check if there is any impurity 2) Check to see if the gear is damaged	Remove the impurity, replace the gear
	6. Axle 1 strikes heavily	Adjust or replace with a new one
	7. The rear axle is out of shape (check to see if it is overloaded）	Replace the rear axle
Lack of breaking force	1. There is interval between the brake shoes and drum.	Adjust the interval
	2. There is oily dirt on the brake shoes or drum.	Remove the impurity
	3.There is air in the brake line	Release the air

Brake trouble and troubleshooting – *Cont'd*

Lack of breaking force	4. The brake line leaks.	Repair the leakage or change the brake line
	5. The brake shoes are over worn.	Replace with a new brake shoes
	6. The brake cable is too long or is blocked.	Adjust the brake cable
The brake is difficult to release completely	1.The brake pedal does not bounce back smoothly	Replace with a new one
	2.The brake shoe is worn	Refit or replace
	3.The is some blockage on the transmission	Refit or replace
The oil leaks	1.The Oil Seal is damaged	Replace with a new one
	2.Too much Oil	Adjust the oil level

5.7 Wheel Replacement

WARNING!

Before doing anything to the wheel and tire, please make sure the power key is positioned to OFF position.

Please read the tire manufacturer's instructions and never exceed their recommendation.

Protect face and eyes from escaping air when removing the valve core.

Be sure the mounting/demounting machine is anchored to floor.

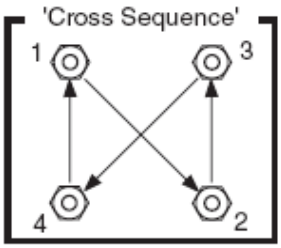
Wear safety equipment when mounting/demounting the wheel and tire.

To remove a wheel on the vehicle:

1) Blocking the wheel, then loosen the lug nuts
2) Use a jack to lift the vehicle, and then remove the lug nuts and the wheel.

To install a wheel on the vehicle:

1) Use a jack to lift the vehicle, and then put the wheel onto the wheel hub with lug nuts.
2) Finger tighten the lug nuts, then tighten lug nuts to 50-85ft.lbs.(70-115Nm) in 20ft.lbs.(30Nm) increments, following the 'cross sequence' pattern



3) Remove the jack.

If the tire is flat, remove the wheel and inflate the tire to the maximum recommended pressure for the tire. Immerse the tire in water to locate the leak and mark with chalk. Place tire plug according to the manufacturer's specifications.

5.8 Brake Adjustment

WARNING!

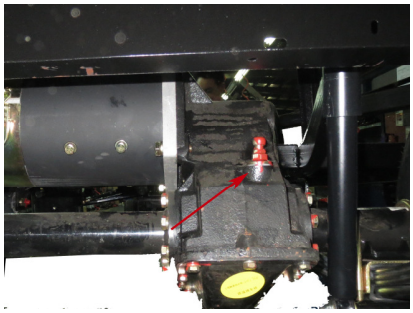
If you have any problem with the brakes, please consult with our dealers. Brake failure can result in serious accident or physical danger.

1) Step down the brake pedal with a force of 30kg or so, keeping the vehicle moving not more than 2/3 of its rated range.
2) The clearance for the brake plate is self-adjusted. Under a force of around 20kgs, the parking brake handle should be fixed in one gear from 5 to 10 ratchets. When this brake handle is released completely, the brake function will stop.
3) Inspect and change brake shoe, add lubrication into the brake bearing periodically.

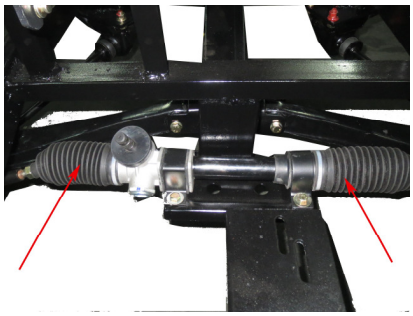
Before you operate the vehicle, please press down on the brake pedal several times to make sure the brakes are functioning properly.

6. Lubrication

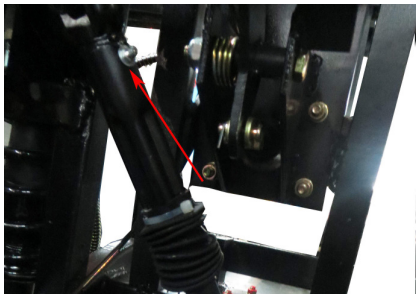
① Use DOT3 for the brake fluid;
② Use 1L of 90GL hypoid gear oil for the rear axle;
③ Lubrication points (use grease): a. steering gears; b. middle shaft; c. horizontal bars; d. steering ball joints; e. bearings;



Rear End



Steering Gear



Middle shaft

7. Running-in of new vehicle

In order to guarantee the performance of the vehicle and enhance its reliability and working life, its parts should experience a certain period of running-in before it works under peak load. Each new vehicle is required to receive one month of running-in time or 1000kms running-in distance, detail procedure is as per the following.
Before running-in, you should check the capacity of battery electrolyte and brake oil. If any insufficiency is found, you should fill it accordingly.

The tire pressure shall comply with the rated pressure marked on the tire.
Limit the speed of the vehicle to control the current of the vehicle under 40A during driving.
Often check and tighten regularly the fixing parts of each connecting points

8. Periodic Maintenance Charts

Regular maintenance is required for the best performance and safe operation of the vehicle.
WARNING! Make sure to turn off the power key and apply the parking brake when you do the maintenance unless otherwise specified. If the owner is not familiar with the maintenance of this vehicle, this work should be done by the dealer from whom you purchased your vehicle.

1D – per day **1W** – per week **1M** – per month **1Q** – per quarter **1Y** – per year

item	Descriptions	1D	1W	1M	1Q	1Y
Battery	1. Check the liquid level. Please add the distilled water if necessary.		Y			
	2. Charge the battery	Y				
	3. Tighten the nut on the battery cable		Y			
	4. Check if the battery is over-discharged (the battery power meter is flashing)	Y				
	5. Check the liquid density of the battery, standard density should be 1.277±0.007g/ cm^3 (80° F. or 25□) when the battery is fully charged.		Y			
	6. Check to see if the battery is charged fully by 2 ways: a) using the hydrometer; b) checking the battery power meter	Y				
	7. Clean the surface of the battery		Y			
Charger	8. Observe the charging status, check if the charger plug becomes hot.	Y				
	9. Clean the surface of the charger. Do not get any water inside the charger.		Y			
Controller	10. Check to see if all terminals are tightened properly. Please do this after the power is off.				Y	
	11. Clean the surface of the controller.				Y	
	12. Check if the solenoid is in order, by checking its touching point.					Y
Motor	13. Check if any water got in. Check if it becomes too hot.	Y				
	14. Check to see if the carbon brush should be replaced.					Y
	15. Check to see if the accelerator pedal works well and if it can be released freely and automatically.				Y	
Chassis and body	16. Check to see if the brake drum and the brake shoe should be replaced or not.				Y	
	17. Check to see if the hand brake functions. (Applicable for vehicle with hand brake).				Y	
	18. Check to see if the line for the brake fluid is leaking. (Applicable for vehicle with hydraulic brake).			Y		
	19. Check to see if the brake fluid inside the brake fluid tank is enough. (Applicable for vehicle with hydraulic brake).			Y		
	20. Check the air pressure inside the tire, check to see if the tire surface is worn, and check if the nuts are tightened properly.		Y			
	21. Check to see if the shock absorber has any oil leaking, is flat or is making any abnormal noise.			Y		
	22. Check to see if there is oil leaking on the gear box and the rear end.		Y			
	23. Add the lubricant inside the wheel hub, steering system.				Y	
	24. Adjust the toe-in of the front end				Y	
	25. Clean the body and seat				Y	
After above maintenance, drive the vehicle to check if the vehicle works properly.						

9. Storage

Please follow the steps as below when the vehicle is stored.

1. Check the liquid level inside the battery. Refill it fully before storing the vehicle.

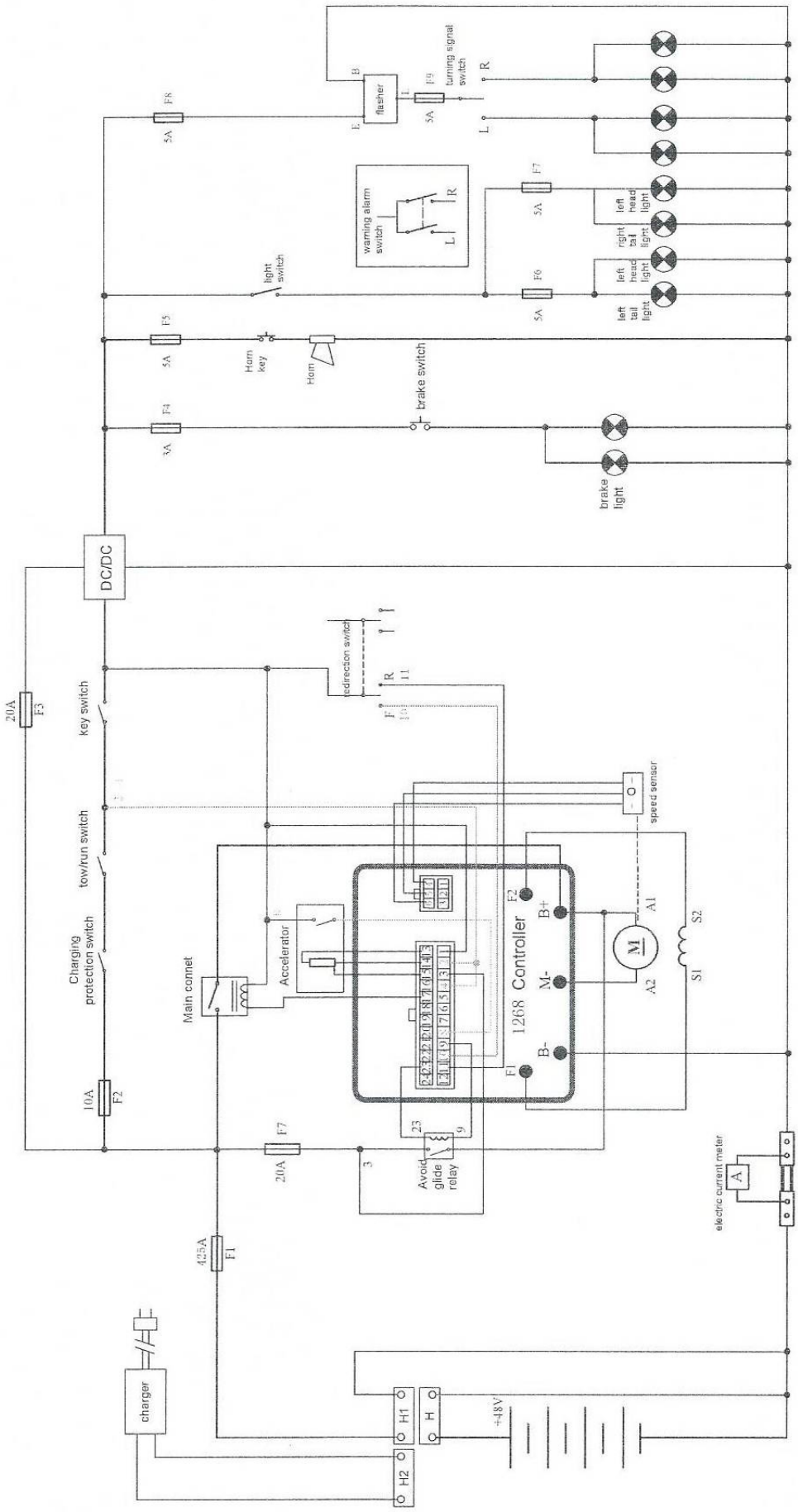
WARNING!

Please charge the battery once a month if your vehicle will be stored more than one month.

2. Turn the power key to OFF, remove the key, and store the key in a safe place.
3. Move the tow switch into TOW position on the controller cover.
4. Check the tire pressure to make sure its pressure is set to recommended pressure.
5. Clean the exterior of the vehicle and apply the rust inhibitor.
6. Cover the vehicle with a breathable cover and store it in a dry, safe and well-ventilated place.
7. If the vehicle is planned to be stored for a long time, then please check the liquid level inside the battery once a month, recharge the battery.

10. Wiring Diagram

1) **Wiring diagram for vehicle 48V with Curtis Controller 1268** (see next page)


DC/DC
Key switch
tow/run switch
Charging protection switch
Main connet
Accelerator
redirection switch
speed sensor
1268 Controller
B+
M-
B-
A1
A2
S1
S2
Avoid glide relay
flasher
turning signal switch
warning alarm switch
light switch
Horn key
Horn
brake switch
brake light
left head light
right tail light
left head light
left tail light
electric current meter
charger
H1
H
H2
+48V
20A
10A
425A
5A

Client Responsibilities

Maintenance Issues

Batteries – Battery fluid must be checked at least once monthly. Use distilled water only. Do no overfill.

Battery Cables – Tighten battery cables per battery manufacturer instructions located on batteries. Failure to tighten once a month could result in damage to the batteries. BEFORE placing the vehicle into service, please check all battery cables and tighten as they may become loose due to turbulence in shipping.

Battery Lock Washers - Make sure a qualified technician maintains lock washers on all battery posts when replacement batteries are needed.

Charger Power Cord – Do not remove the manufacture tag on the power cord as doing so will void the warranty. Always unplug the charger before turning the vehicle on.

Charging – Each charger must have a dedicated circuit with 20 amps. Vehicle should be left plugged in when not in use. Charger will trickle charge at 80% only when needed. Improper charging will lower range.

Extension Cords – We do not recommend using an extension cord to charge. If you do use one, it must be heavy duty (10 gauge) as the extension cord will determine how many amps the charger will receive.

Parking Brake – All vehicles have a parking brake (hand or foot). Driving with parking brake engaged will damage the motor and braking systems and can create a fire hazard. Always disengage the parking brake before driving.

Storage – Vehicles should NOT be left out in the elements 24/7. We recommend storing covered in a garage environment in order to preserve the integrity of the paint and fit/finish of the vehicle.

Tires – Must be inflated to proper capacity. Upon delivery, please check all lug nuts and tighten as they may become loose due to turbulence in shipping. Additionally, check lug nut tightness once a month.

Tow Switch – Must be pointed to “Run” and not “Tow” to operate. Must be in “Tow” position if towing.

This manual tries to be as sound and elaborate as possible in literal and figurative description as well as technical description on the basis of existent data. At the same time, our company reserves the right to alter the content of this manual and this manual is subject to change without prior notice. In addition, our company has the final interpretation right of this manual.

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May 2015